

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Yasuo TANO

Application No.: New U.S. National Stage of  
PCT/JP01/11135

Filed: March 22, 2002

Docket No.: 112372

For: HOLDING APPARATUS FOR VITREOUS BODY SURGICAL CONTACT LENS  
AND HOLDING PORTION AND CONNECTING PORTION FOR VITREOUS BODY  
SURGICAL CONTACT LENSPRELIMINARY AMENDMENTDirector of the U.S. Patent and Trademark Office  
Washington, D. C. 20231

Sir:

Prior to initial examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Page 4, line 20 to page 5, line 6, delete current paragraph and insert therefor:

For example, in so-called triple surgery, in which three types of surgery, that is, ultrasonic surgery for emulsifying and sucking crystalline lens, retina and vitreous body surgery, and surgery for inserting an interocular lens are performed at the same time, the surgery progresses in the order of, for example, (1) ultrasonic emulsification and suction of the crystalline lens, (2) vitreous body surgery, (3) interocular lens insertion, and (4) air displacement and interocular light solidification, and the surgical lens 50 is necessary in the stages of (2) and (4) while the surgery cannot be performed if the surgical lens 50 and the lens ring 30 are stitched on the eyeball 100 in the stage of (3). As a result, it is required to

detach the lens ring 30 by cutting or loosening the suture 60 when the stage goes from (2) to (3) and to stitch the lens ring 30 again when the stage goes from (3) to (4).

Page 6, lines 18-20, delete current paragraph and insert therefor:

A sixth invention is the holding apparatus for the vitreous body surgical contact lens according to the fifth invention, which is characterized in that the elastic member is a cord body.

Page 6, line 24 to page 7, line 3, delete current paragraph and insert therefor:

An eighth invention is the holding apparatus for the vitreous body surgical contact lens according to any one of the first to seventh inventions, which is characterized in that the holding portion for the vitreous body surgical contact lens has an engaging portion to be hooked by the connecting portion, and that the connecting portion has a hole to be engaged with the engaging portion.

Page 21, lines 17-23, delete current paragraph and insert therefor:

Moreover, as in the eyelid opener portions 10a and 10b and the lens ring 30, the connecting portion is required to be harmless to the human body so as not to cause allergy, to be easy to sterilize, and so on, and considering the cost for the material, silicon rubber, fluorine rubber, and the like are preferable as the rubber material, stainless steel, aluminum, titanium, and the like are preferable as the metallic material, and polymethyl methacrylate and the like are preferable as the resin material.

Page 26, lines 14-18, delete current paragraph and insert therefor:

In the holding apparatus 3, the same pair of eyelid opener portions 10a and 10b and spring portion 20 as those described in the above description of the holding apparatuses 1 and 2 can be used and the same connecting portion 42 as that described in the above description of the holding apparatus 2 can be used.

IN THE CLAIMS:

Please replace claims 3-5, 7-9, 11-12 and 14-15 as follows:

3. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 1,  
wherein said eyelid opener portions have a structure in which a portion for pulling the upper eyelid and a portion for pulling the lower eyelid are integrated with an elastic portion therebetween.
4. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 1,  
wherein said holding portion for the vitreous body surgical contact lens has a shape of a ring.
5. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 1,  
wherein said connecting portion is composed of an elastic member.
7. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 5,  
wherein the elastic member is silicone rubber.
8. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 1,  
wherein said holding portion for the vitreous body surgical contact lens has engaging portions engaging with said connecting portion, and  
wherein said connecting portion has a hole to be engaged with the engaging portions.

9. (Amended) The holding portion for the vitreous body surgical contact lens, which is used for the holding apparatus for the vitreous body surgical contact lens according to claim 1, comprising:

engaging portions in at least two positions,

wherein said holding portion is used by connecting with said eyelid opener portions via said connecting portion which engages with the engaging portions.

11. (Amended) The holding portion for the vitreous body surgical contact lens according to claim 9,

wherein a surface of the cylindrical body portion forming said holding portion for the vitreous body surgical contact lens is frosted.

12. (Amended) The connecting portion used for the holding apparatus for the vitreous body surgical contact lens according to claim 1, comprising:

a closed loop member for connecting said holding portion for the vitreous body surgical contact lens having elasticity and being capable of connecting said holding portion for the vitreous body surgical contact lens in a semi-fixed state with friction.

14. (Amended) The connecting portion according to claim 12,

wherein at least one or more engaging holes for engaging with the engaging portions of said holding portion for the vitreous body surgical contact lens are provided in the closed loop member having the ring shape.

15. (Amended) The connecting portion according to claim 12,

wherein a substantially rectangular engaging hole is provided in the closed loop member having the ring shape.

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REMARKS

Claims 1 - 15 are pending. By this Preliminary Amendment, claims 3-5, 7-9, 11-12 and 14-15 and the specification are amended. Prompt and favorable examination on the merits is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. 1.121(c)(1)(ii)).

Respectfully submitted,

  
James A. Oliff  
Registration No. 27,075

Joel S. Armstrong  
Registration No. 36,430

JAO:JSA/mlb  
Attached: Appendix  
Date: March 22, 2002

**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

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## APPENDIX

Marked up copies of pages 4 and 5 are attached hereto.

Page 6, lines 18-20:

A sixth invention is the holding apparatus for the vitreous body surgical contact lens according to the fifth invention~~claim 5~~, which is characterized in that the elastic member is a cord body.

Page 6, line 24 to page 7, line 3:

An eighth invention is the holding apparatus for the vitreous body surgical contact lens according to any one of the first to seventh inventions~~claims 1 to 7~~, which is characterized in that the holding portion for the vitreous body surgical contact lens has an engaging portion to be hooked by the connecting portion, and that the connecting portion has a hole to be engaged with the engaging portion.

Page 21, lines 17-23:

Moreover, as in the eyelid opener portions 10a and 10b~~10~~ and the lens ring 30, the connecting portion is required to be harmless to the human body so as not to cause allergy, to be easy to sterilize, and so on, and considering the cost for the material, silicon rubber, fluorine rubber, and the like are preferable as the rubber material, stainless steel, aluminum, titanium, and the like are preferable as the metallic material, and polymethyl methacrylate and the like are preferable as the resin material.

Page 26, lines 14-18:

In the holding apparatus 3, the same pair of eyelid opener portions 10a and 10b and spring portion 20 as those described in the above description of the holding apparatuses 1 and 2 can be used and the same connecting~~supporting~~ portion 42 as that described in the above description of the holding apparatus 2 can be used.

## Changes to Claims:

The following are marked-up versions of the amended claims:

3. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 1 ~~either claim 1 or claim 2~~,

wherein said eyelid opener portions have a structure in which a portion for pulling the upper eyelid and a portion for pulling the lower eyelid are integrated with an elastic portion therebetween.

4. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 1 ~~any one of claims 1 to 3~~,

wherein said holding portion for the vitreous body surgical contact lens has a shape of a ring.

5. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 1 ~~any one of claims 1 to 4~~,

wherein said connecting portion is composed of an elastic member.

7. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 5 ~~either claim 5 or claim 6~~,

wherein the elastic member is silicone rubber.

8. (Amended) The holding apparatus for the vitreous body surgical contact lens according to claim 1 ~~any one of claims 1 to 7~~,

wherein said holding portion for the vitreous body surgical contact lens has engaging portions engaging with said connecting portion, and

wherein said connecting portion has a hole to be engaged with the engaging portions.

9. (Amended) The holding portion for the vitreous body surgical contact lens, which is used for the holding apparatus for the vitreous body surgical contact lens according to claim 1 ~~any one of claims 1 to 8~~, comprising:

engaging portions in at least two positions,

wherein said holding portion is used by connecting with said eyelid opener portions via said connecting portion which engages with the engaging portions.

11. (Amended) The holding portion for the vitreous body surgical contact lens according to claim 9~~either claim 9 or claim 10~~,

wherein a surface of the cylindrical body portion forming said holding portion for the vitreous body surgical contact lens is frosted.

12. (Amended) The connecting portion used for the holding apparatus for the vitreous body surgical contact lens according to claim 1~~any one of claims 1 to 8~~, comprising:

a closed loop member for connecting said holding portion for the vitreous body surgical contact lens having elasticity and being capable of connecting said holding portion for the vitreous body surgical contact lens in a semi-fixed state with friction.

14. (Amended) The connecting portion according to claim 12~~either of claim 12 or claim 13~~,

wherein at least one or more engaging holes for engaging with the engaging portions of said holding portion for the vitreous body surgical contact lens are provided in the closed loop member having the ring shape.

15. (Amended) The connecting portion according to claim 12~~either of claim 12 or claim 13~~,

wherein a substantially rectangular engaging hole is provided in the closed loop member having the ring shape.



To begin with, a first problem is that the passing the surgical needle in such a manner as to scoop up the upper half layer of the sclera 130 is an operation requiring the greatest care and time even for a skilled surgeon. Moreover, since this stage is a preparatory stage for the interocular surgery, imposing a burden of paying attention on the surgeon and consuming the time in this stage are greatly disadvantageous to the subsequent interocular surgery.

Further, a second problem is that, even if the skilled surgeon pays close attention, in case the surgical needle penetrates the sclera 130, tissues under the sclera are damaged, which may cause a complication after the surgery.

A third problem is that, even if the surgery needle does not penetrate the sclera 130, it is obvious that the surgical needle and the suture 60 are invasive for the sclera 130.

A fourth problem is that, since the lens ring 30 is fixed on the eyeball 100, every time when the lens ring 30 interferes with a surgical operation as the surgery progresses, the lens ring 30 is needed to be detached by cutting the suture 60 or by untying the temporary knot 61 to loosen the suture 60 and the first to third problems are repeated.

For example, in so-called triple surgery, in which three types of surgery, that is, ultrasonic surgery for emulsifying and sucking crystalline lens, retina and vitreous body surgery, and surgery for inserting an interocular lens are performed at the same time, the surgery progresses in the order of, for example, <sup>1</sup>(X) ultrasonic emulsification and suction of the crystalline lens, <sup>2</sup>(X) vitreous body surgery, <sup>3</sup>(X) interocular lens insertion, and <sup>4</sup>(X) air displacement and interocular light solidification, and the surgical lens 50 is

necessary in the stages of (<sup>2</sup>~~A~~) and (<sup>4</sup>~~X~~) while the surgery cannot be performed if the surgical lens 50 and the lens ring 30 are stitched on the eyeball 100 in the stage of (<sup>3</sup>~~X~~). As a result, it is required to detach the lens ring 30 by cutting or loosening the suture 60 when the stage goes from (<sup>2</sup>~~A~~) to (<sup>3</sup>~~X~~) and to stitch the lens ring 30 again when the stage goes from (<sup>3</sup>~~X~~) to (<sup>4</sup>~~X~~).

A fifth problem is that, since the lens ring 30 is fixed on the eyeball 100, there is a part which cannot be observed even if the surgical lens 50 is rotated or replaced as described above.

10 In this case, conventionally, the surgical lens 50 is slightly tilted in the lens ring 30 to perform observation, but it is difficult to finely adjust the tilt.

As a result of dedicated study in order to solve the aforesaid problems, the inventors have thought that the problems can be solved all at once if the  
15 lens ring 30 is connected to the eyelid openers 10, not to the eyeball 100.

#### Disclosure of the Invention

More specifically, a first invention is a holding apparatus for a vitreous body surgical contact lens, which is characterized in that it  
20 comprises: eyelid opener portions for pulling and opening an upper eyelid and a lower eyelid; a holding portion for holding the vitreous body surgical contact lens on an eyeball; and a connecting poring for connecting the eyelid opener portions with the holding portion for the vitreous body surgical contact lens, in which the vitreous body surgical contact lens is held on the  
25 eyeball.

A second invention is the holding apparatus for the vitreous body